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A SPRITE IN THE DARK: SUPPORTING CONVENTIONAL MENTAL HEALTHCARE PRACTICES WITH A TANGIBLE DEVICE

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Abstract

This paper describes the decision-making and motivation behind the development of Mood Sprite – an interactive tool for mental health. Our main aim with this project has been to design a device that compliments and augments the current practices employed by community mental health support groups. To this end, we worked directly with a community support group and a psychologist as co-designers.

Introduction

There are a range of charities, voluntary community groups and public funded organizations that provide mental health and wellbeing support in the UK. These groups provide an array of different in-house treatments, including the prescription of medication by psychiatrists, one-on-one talking therapies with psychologists, peer support sessions and educational sessions. Healthcare professionals are trained to treat a range of different illnesses, including anxiety disorders, depression, bi-polar, eating disorders, obsessive compulsive disorders and post-traumatic stress disorders. In some cases, these issues relate to traumatic life events. In others, they stem from medical illnesses. [22].

Unlike many forms of physical healthcare, mental healthcare professionals are unable to administer a treatment directly for the illness. Instead they act as a conduit, teaching individuals to manage and make sense of their mental wellbeing themselves. They convey new ways of perceiving the problem and provide strategies, and tools, to help individuals to adapt their lifestyle to support their needs. Communication is a crucial part of this kind of treatment. For talking therapy to be effective, the service user must be able to convey their experiences to the psychologist. Likewise, participants must be able to share their experiences openly to benefit from peer-support groups.

Mental wellbeing and healthcare is a complex area of technological intervention. This is, in part, due to the fact that the illnesses themselves are not fully understood. A set of medical definitions have been formed to cover various symptoms but they are constructs that don't sufficiently encapsulate all cases. Often treatment therefore involves a healthcare professional piecing together the unique set of emotional and personality characteristics of an individual and adapting the treatment on a case by case basis [11].

This definitional fuzziness presents a design problem where HC-I research is concerned: Without engaging in detailed psychological research and analysis before generating the design requirements, designers run the risk of relying on perceived design problems that don't match up with the real life problem. This can lead to the development of a system that does not meet the users' needs.

In this project we have chosen to build our approach around the requirements of a single community mental health support group. The final design has been shaped around the structure of their sessions and the needs of their service users, therefore it is important to first explain who this group are and how they function:

The community mental healthcare group provide peer-support group sessions. Although they have an open door policy, the service users who have been drawn to the group have tended to have a specific profile: They suffer from one of, or a combination of, anxiety, depression and self-harm.

During the peer-group sessions, the healthcare professionals take a hands-off approach, where they let the service users lead the discussion. The only structure they apply is that they ask each person who is present if they would like to 'check-in' at the beginning of the session. This is a chance for each person to update the group about how their week has been – something that goes on to provide stimulus for the discussion afterwards. The purpose of these sessions is to help the service users to reflect upon their mental wellbeing and gain a greater sense of confidence and social inclusion from speaking with their peers.

Through discussions with the management team who run this group, we built up a picture of how technology might be used to support their practices: *Reflection, a calm environment, openness, shared empathy, unguided communication* and the *physical expression of internal conflicts* were identified as some of the key characteristics of the group's approach. It became quickly apparent that they saw interactive technology

as an opportunity to extend this type of support beyond their fortnightly session and into the everyday lives of the service users. We subsequently discussed how an interactive device could be a vessel, channeling the therapy continually between everyday life and back to the group. We also discussed how the form and functionality of the device might impact upon how it is perceived and whether the user group buy-in to the project. As such, it was felt that the device should be aesthetically pleasing, should induce calm and be associated with positive experiences. It should also be flexible and usable in other healthcare settings, such as counselling.

Following this, we consulted the opinions of a psychology researcher to see how this support group's approach fitted into mental healthcare practice research more generally. The researcher picked up on 'physical expression of internal conflicts' as an interesting psychology research perspective to explore in particular. We discussed how the effects of GUI's can be both positive and negative, providing the means for vulnerable people to make social connections [4] and overcome social stigma's by controlling their self-presentation [2]. But also leading to unmonitored cyber bullying [9], increased feelings of physical loneliness [10] and, in some cases, an altered sense of empathy with others [3,6].

These discussions with the community support group and the psychology researcher led us towards setting a number of criteria for the design. Given that the peer-group sessions were built around reflection and the sharing of experiences, we decided that the primary objective of the device should be to encourage *reflection*. This is a topic that has received plenty of

attention in HCI research. The potential that computer systems had for life-logging was acknowledged a number of years ago [3] [15]. It was hoped that this information would help people to reflect upon themselves and provide a new way of thinking about identity. Subsequent research though revealed that 'total capture' on this scale actually made it difficult to reflect upon life experiences. There was simply too much data and too little contextual information for the user to process [16]. In addition, the ubiquity and scale of life logging data on social media websites can actually become a greater concern when the information contains painful memories that the user wants to forget [14].

Sellen and Whittaker [16] and Petrelli et al.[10] have conceptualized a more nuanced approaches to designing technologies for reflection. One which prioritizes emotional involvement with individual experiences over the scatter gun approach of total capture. A number of diary applications have been developed for mobile phones, which let the user dictate what experiences they capture and when they capture them. Some have been designed specifically as mental health and wellbeing interventions [4,5,8], working on the theory that our memory has a positivity bias [19] and a fading affect bias [21], which can give us a more positive outlook on the future.

Studies by Whittaker et al. [8] and Van Gennip et al. [9] have found that people are likely to create stronger emotional relationships with physical memento's than they are with digital ones. A number of recent projects have played with this idea, such as Memento an audial memory locket [9], Penseive, a memorialisation box

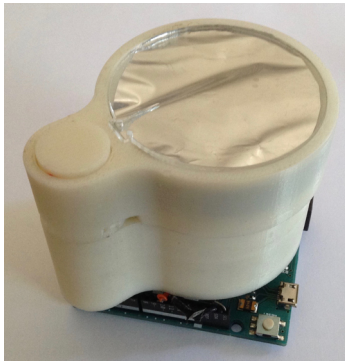
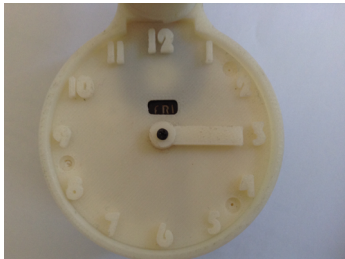
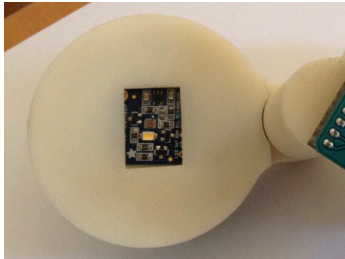


Fig 1. The mood sprite.
From Top - Front, back,
clock and closed

[12], and Spyn [13], a toolkit for encoding thoughts into the fabric of a knitting pattern.

Founded on a phenomenological approach to human consciousness, these devices are designed to engage the user in multi-sensory interaction so that the interactive experience corresponds more closely with their normal everyday experiences [2]. We aimed to integrate embodied interaction modalities like this into our design. We felt that this would manifest the objective of giving the target users an outlet for *physical expression of internal emotion*. This seemed to be particularly pertinent for our target user group because a large majority of them are currently resorting to self-harm as a means for expression.

The third criteria for our design was that it should *induce a sense of calm* when it is being used. It should channel the users' thoughts away from their internal conflict and onto something soothing and mesmerizing in their external world. This is the basis of mindfulness, which is a practice that is applied widely in mental health therapy [6]. Some elements of the psychological approach to mindfulness have found their way into H-CI research in the form of Weiser's concept of calm technology [20] and the application of Csikszentmihalyi's concept of flow [1,12]. We see this manifested in the design of calm-inducing, tangible interactive technologies such as Inner Garden [13] mindspheres [7] and the mindfulness sphere [17].

The Mood Sprite Design

The final design is displayed in fig 1. Its main visible features are the clock face, with day-dial, its hinge and its infinity mirror led display.

Inside the clock barrel are found a series of gears that make the day correspond with the time (every 2 full turns of the hour hand, the day gear turns $1/7^{\text{th}}$), a rotary encoder that registers the time on the display, an accelerometer battery and microcontroller.

Inside the display barrel are found a colour sensor, a mirror and a piece of one-way mirror tint stuck to perspex. This combination of mirrors creates an infinity mirror which gives the impression that the light of the LED's pour away infinitely into the distance.

We will now describe a use case to convey how we perceive the device might be used:

Laura suffers from depression. She receives counselling for her illness and attends peer group classes. One day during the peer group session, she and her peers are given mood sprite devices. Laura tucks it away in her handbag. The following day (Saturday) while she is at home she begins to feel anxious. She finds that she is ruminating about something that she heard one of her colleagues at work say. She is finding it difficult to stop ruminating and a feeling of hopelessness is starting to build.

After a while she remembers that she was given the device the previous day and digs it out of her handbag. She opens it up by sliding the display around and away from the clock face and then changes the time on the clock to reflect that on her watch. Next, she looks around the room to find something that might reflect her current emotions. She sees an old, forgotten purple handbag in the corner of the room under a pile of clothes and decides to make that her target. Laura walks over to the handbag holds the mood sprite up to

the handbag and then presses the button in the centre of the clock face. Suddenly, purple light begins to rush into the display. She finds that the longer she holds the button down the, the more light rushes in. Laura lets go of the button when she feels that she has enough purple. (At this point the microcontroller inside the device stores the light display she created in its memory and associates it with the time on the clock. This makes it retrievable in the future)

Now, holding the device in front of her Laura begins to rock it gently backwards and forwards. As she does so, the lights start whizzing around the display like a sprite flying. The more she rocks, the more they move. When she is satisfied with this she closes the device and pops it back into her bag.

At various moments over the next few days, Laura does the same thing – capturing sprites in the device to reflect her experiences. At the end of the week it's time for another counselling session. At the counselling session, Laura takes the device out of her bag and begins to use it as a stimulus for the talking therapy about her experiences over the course of the previous week. She uses the clock face to cycle back in time to the beginning of the week and then goes through each of the sprites she registered with her counsellor, reflecting upon the memory they represent.

She uses the device once again at her peer-support group. She shows the rest of the group the different types of sprite that she created, as do other members of the group. These act as a stimulus for discussion. At the end of the session all the members of the group, record the colour of their sprites and the times on a

large paper collage. Then they take the devices away for another week of use.

Future Work

The next stage of the project will be to test the device's functionality. We are currently still in the prototyping stage (hence why there is an oversized Arduino stuck to the back of the it in the images). In the near future we will be running some user tests. An important part of this will be finding out how well it can help with the recollection of memories. The device captures very little information about the experience itself – only the time that it happened and the colour of an object in the room. It will be interesting to discover how effectively this abstract representation of an event can rekindle the original memory. A recent project, Pix – a ring that can be used to take a picture and then display it in a low resolution [18], played with the idea that low resolution images can hold meaningful information. We would like to explore this idea further.

Ultimately though the bulk of the user testing will focus on establishing the impact that the device can have on mental wellbeing – exploring different use case and their implications. We are particularly interested in how the forms of embodied interaction fostered by the device can impact upon the mental wellbeing of the user group.

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